Beyond the ordinary: giant ameloblastoma of the jaws - a case series with clinico-radiological features and treatment outcomes

Sonia Mundu[1*], Fakir Mohan Debta[2], Shreeyam Mohapatra[3], Kunal Agarwal[4], Priyanka Debta[5]

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ABSTRACT

Background: Giant ameloblastoma is a rare, benign but locally aggressive odontogenic tumor characterized by massive jaw enlargement, accounting for 1% of all jaw tumors, often affecting the mandible. It presents with slow but relentless growth, causing significant facial deformity and functional impairment.

Case Presentation: We report two cases of Giant Ameloblastoma. The first patient reported to the outpatient department an expansile swelling involving the mandible crossing the midline, extending approximately from the right side of the angle to the left side angle. 15.2 cm x 10.5 cm x 11 cm. The second case was reported to the outpatient department, with an expansile swelling involving the right mandible and maxillary region, which was 10 cm x 12cm x 7cm. Both patients had an extraoral draining sinus on the lesion, and both had a previous history of surgery in that region, 20 years back and 11 years back, respectively. The pre-operative investigation included an OPG, CT scan, and haematological parameters. Surgical treatment involved Hemimandibulectomy with adequate margins and microvascular reconstruction with fibular free flap in a single stage.

Conclusion: Tumor histology, anatomical location, and adequacy of tumor resection with safety margins are various factors that influence tumor recurrence and thus must be considered along with the possibility of malignant transformation while formulating a treatment plan for revision cases.

Keywords: Giant ameloblastoma, recurrent ameloblastoma, hemimandibulectomy, free fibular flap, soap-bubble appearance, case series.

Type of Article: CASE SERIES **Specialty:** Dentistry (Oral medicine and Radiology)

Correspondence to: Sonia Mundu
*Postgraduate, Department of Oral Medicine and Radiology, SCB Dental College and Hospital, Cuttack, India.
Email: soniamundu1996@gmail.com
Full list of author information is available at the end of the article.

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Introduction

Ameloblastoma is a benign odontogenic epithelial neoplasm, accounting for approximately 1% of all head and neck tumors and nearly 10% of odontogenic tumors [1]. Despite its non-malignant histology, it exhibits locally aggressive behavior and a high potential for recurrence if not adequately managed. The conventional form is noted for its greater propensity for cortical bone destruction, soft tissue extension, and recurrence compared to other variants [2]. Giant ameloblastomas – though rare – are those lesions that grow over many years to massive sizes, causing not only jaw expansion and facial deformity but also functional impairment such as difficulty in mastication, speech, swallowing, and, in some cases, systemic complications. Their size often reflects delayed presentation, limited access to healthcare, and/or patient reluctance due to fear, cost, or morbidity of surgery [3,4].

The optimal management of giant ameloblastoma is challenging. Conservative treatments (e.g., enucleation, curettage, and marsupialization) may preserve more native tissues but frequently result in high recurrence rates. Radical surgical resection with safe margins remains the mainstay for extensive lesions. Reconstruction following such resection has evolved to include free vascularized bone flaps (notably, the fibular free flap), which allow for restoration of mandibular continuity, facial symmetry, and functional rehabilitation in a single stage when feasible [3,5]. Despite advances, delaying definitive surgery in giant ameloblastomas often results in higher morbidity, more extensive resections, significant aesthetic compromise, and more difficult reconstructions. In this case series, we present two patients with giant ameloblastoma of the mandible, each with substantial jaw involvement and extraoral drainage. We describe their clinical presentation, imaging findings, prior treatment, surgical

management (including radical mandibulectomy and microvascular free-fibular flap reconstruction), and the postoperative outcomes concerning functional restoration, aesthetic recovery, and oncological control. The aim is to contribute to the literature on giant ameloblastoma by demonstrating that even large, long-neglected tumors can be resected with acceptable outcomes when managed decisively.

Case Presentation

Case 1

A 40-year-old female presented with a progressively enlarging mandibular swelling of 10 years' duration. Initially small and insidious, the lesion gradually reached its current size. She reported dull, aching pain, intermittent foul-smelling purulent discharge, mucosal ulceration, and functional impairment, including difficulty with mouth opening, speech, mastication, and swallowing. Numbness and paranesthesia were also noted. No systemic symptoms such as weight loss or fatigue, were reported. The patient gave a history of a similar swelling in the same mandibular region 20 years earlier, treated surgically, though records were unavailable.

Extraoral examination revealed a massive expansile swelling from the right mandibular body to the left angle, measuring ~15 × 6 cm. The skin appeared stretched, with lobulation over the left parasymphysis. The lower lip was displaced inferiorly. Consistency varied from firm to bony hard on palpation, and the lesion was non-tender.

Intraorally, the swelling caused stretching of the floor of the mouth and gingivobuccal sulcus, with loss of multiple mandibular teeth and lingual displacement of remaining teeth i.e. from 41–46. There was obliteration of the labial and buccal vestibules and the floor of the mouth. The mucosa appeared normal, though bleeding and discharge occurred on palpation. The swelling was firm to bony hard without fluctuations or pulsations (Figure 1).

Radiographic examination Posteroanterior (PA mandible) demonstrated a large expansile lesion extending from the right angle to the left ramus, measuring ~6 cm superoinferiorly. The lesion had a thin, well-defined border and mixed radiolucent-radiopaque appearance with a classic multilocular "soap-bubble" pattern, along with inferior mandibular expansion.

Contrast-enhanced CT confirmed a multiloculated expansile lesion measuring 14.9 × 10.2 × 10.8 cm, involving the left ramus, angle, body, and extending to the right side, with cortical erosion but no calcification. (Figure 2) Bilateral subcentimetric lymph nodes were seen. Fine needle aspiration cytology showed basaloid and mature squamous cells in an inflammatory background, suggesting ameloblastoma. Postoperative follow-up revealed no recurrence, with satisfactory aesthetic, functional, and social outcomes after immediate reconstruction.

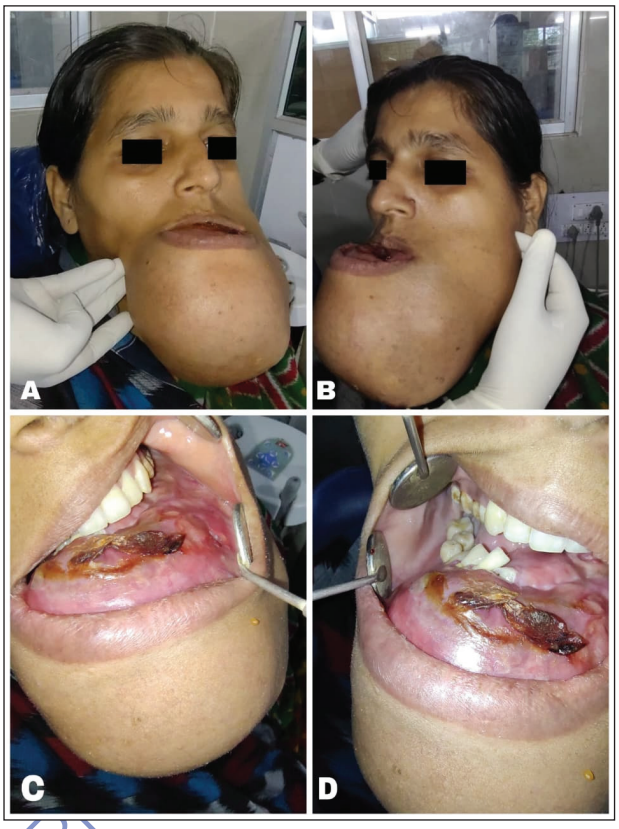

Figure 1. *(A and B) and (C and D) Extraoral and intraoral examination of the expansile lesion.*

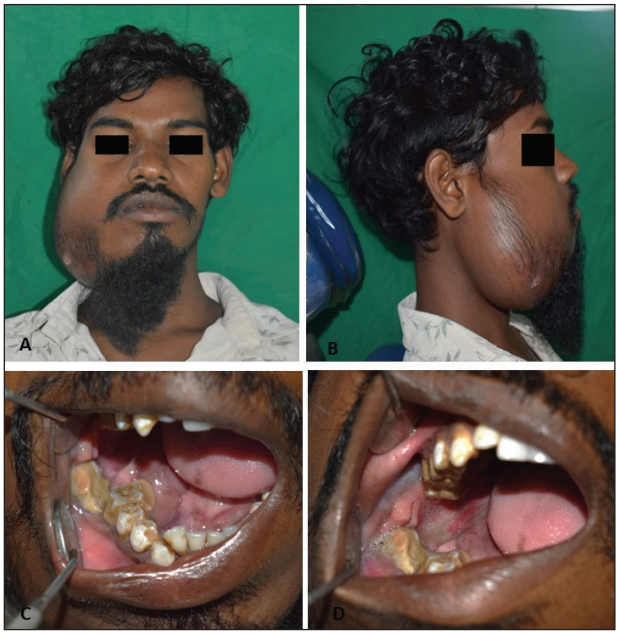

Figure 3. *(A and B) and (C and D) Extraoral and intraoral examination of the expansile lesion.*

Case 2

A 23-year-old male presented with a progressively enlarging right facial swelling that had persisted for 10 years. The lesion was insidious, initially painless, but had become tender in recent months. The patient reported intermittent purulent discharge from an extraoral sinus near the right

mandibular border. His history was significant for the surgical excision of an ameloblastoma in the same region 11 years earlier. The current swelling caused difficulty in chewing, mild speech impairment, and considerable aesthetic and psychological distress. No systemic symptoms such as fever, malaise, or weight loss were noted.

Extraoral examination revealed a significant expansile mandibular swelling involving the maxilla, measuring ~8 × 8 cm, with tense overlying skin and an active purulent sinus near the mandibular border. No lymphadenopathy was present. Intraorally, there was restricted mouth opening, obliteration of buccal and lingual vestibules of the mandible and maxilla with missing 48, mobility and displacement of posterior teeth from 43-47, heavy calculus deposits, cortical plate expansion, and mucosal ulceration overlying the lesion (Figure 3).

Radiographic evaluation showed a solitary, well-defined, oval expansile lesion involving the right mandible and maxilla, measuring ~8 × 4 cm. It demonstrated a decorticated periphery, inferior maxillary and mandibular borders expansion, and a mixed radiolucent-radiopaque pattern with a multilocular "soap-bubble" appearance. A tooth-like structure was noted along the lateral aspect. Computed tomography confirmed a multilocular expansile lesion with cortical destruction, extension into the maxilla, and soft tissue involvement, but no metastasis (Figure 4).

Laboratory evaluation revealed anemia, thrombocytosis, and elevated C-reactive protein. Hematology consultation attributed the anemia to nutritional deficiency, requiring preoperative transfusion; the thrombocytosis remained unexplained.

Management of cases

Considering the benign nature of the lesion and the adequacy of resected margins confirmed in the intraoperative frozen section, immediate reconstruction was planned. A multidisciplinary team of oral and maxillofacial surgeons and radiologists provided preoperative clearance in consultation with Pulmonary Medicine, Cardiology, and Anesthesiology. Following optimization, the patient underwent right hemimandibulectomy with single-stage reconstruction using a free fibula osteocutaneous flap.

Based on the peroneal vessels, the flap was harvested from the left lower limb in the standard manner. Microvascular anastomosis was performed between the peroneal and facial artery, while the two venae comitantes were anastomosed with the internal jugular vein. The immediate postoperative course in the intensive care

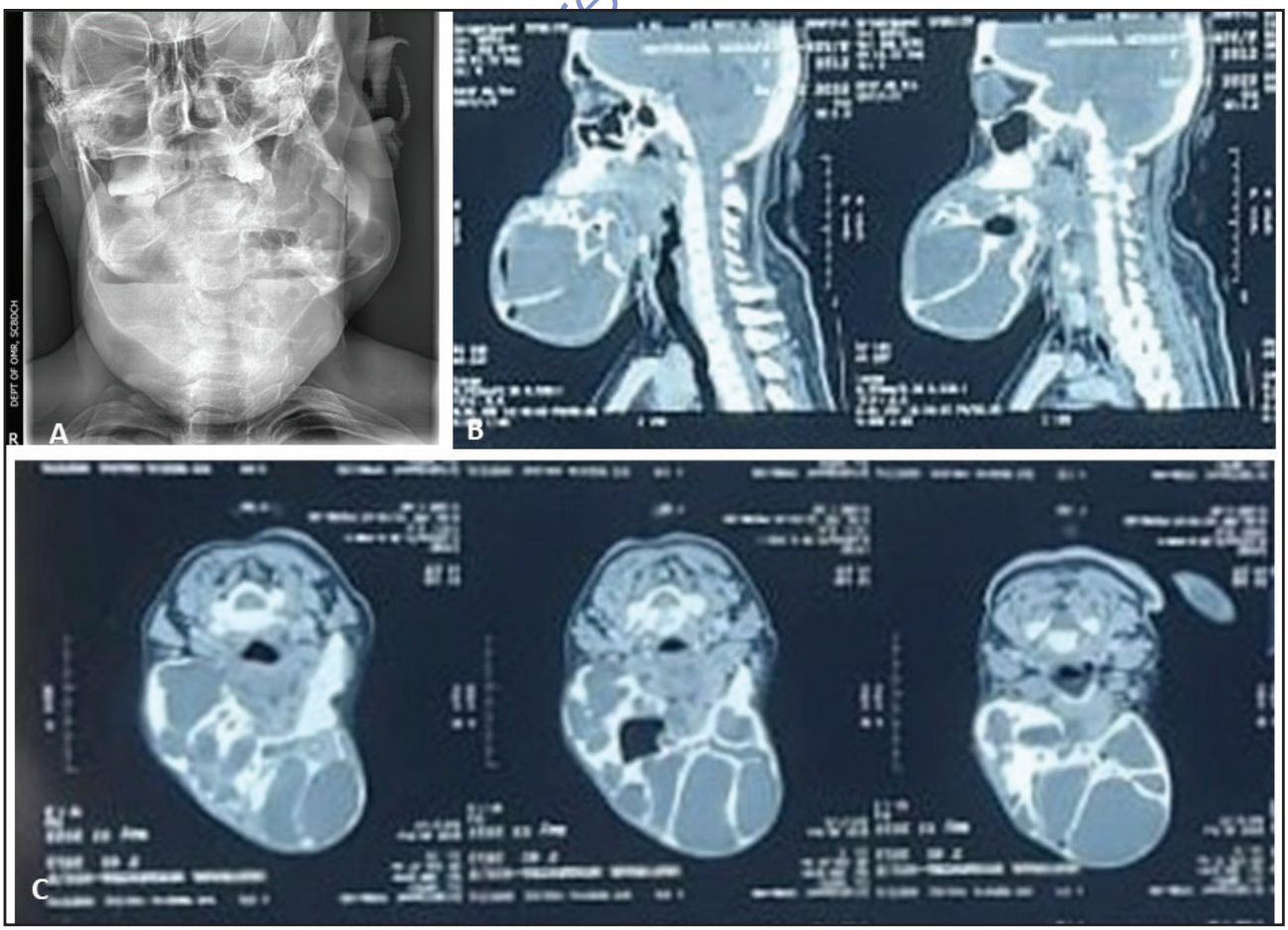

Figure 2. *A, B, and C Radiographic examination of the expansile lesion.*

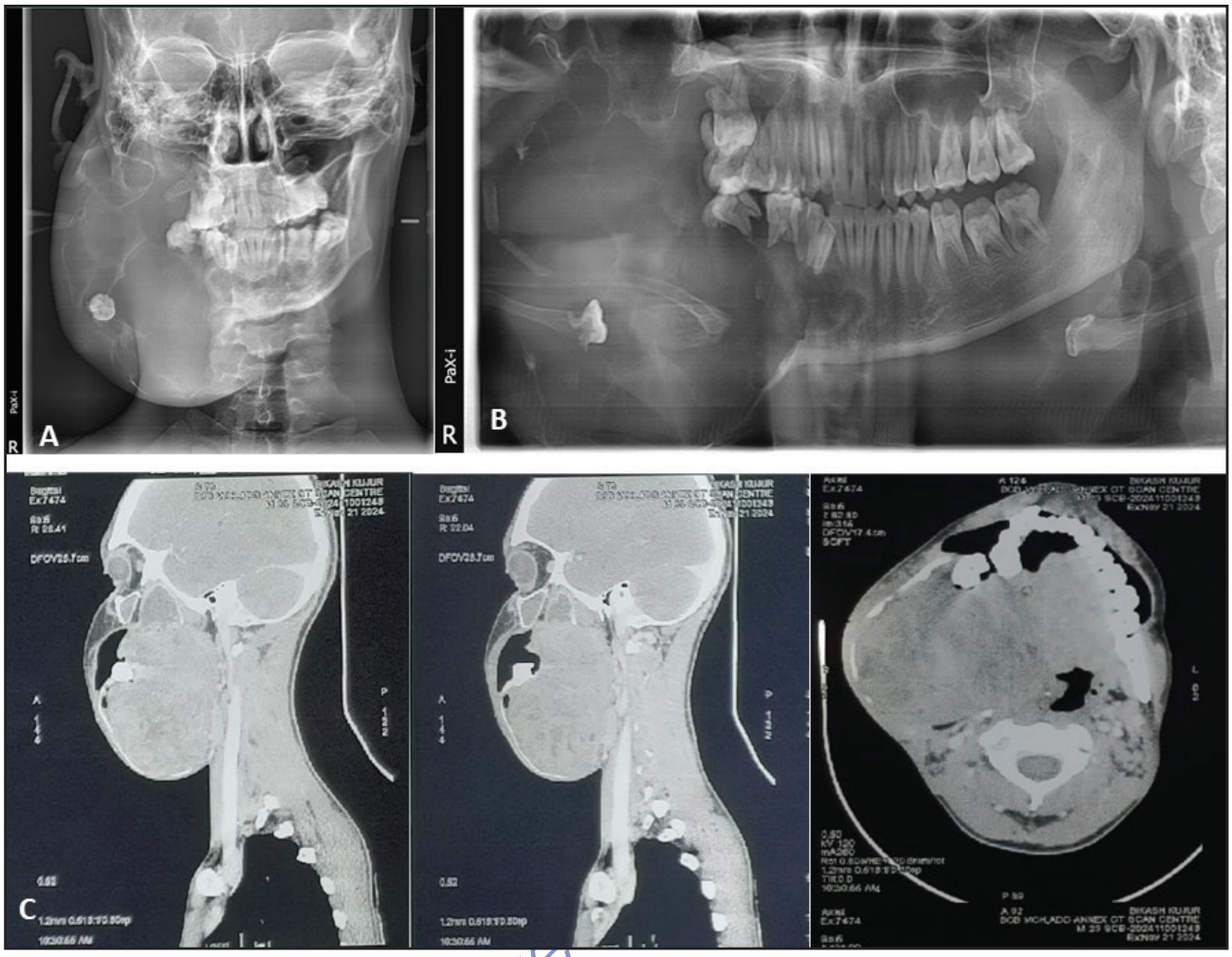

Figure 4. *(A, B, and C) Radiographic evaluation of the expansile lesion.*

unit was uneventful, and the patient was discharged on the 10th postoperative day.

Gross histopathological examination revealed a specimen weighing 1.8 kg and measuring 15 × 14 × 12 cm, including the coronoid and condylar processes and the inferior mandibular border. The specimen contained teeth extending from 33 to 47 (Figure 5). Microscopy demonstrated proliferative ameloblastic epithelium arranged in follicles, interconnecting strands, and cords. Peripheral tall columnar cells displayed nuclear palisading, surrounding stellate reticulum-like cells with degenerative changes, set within a hypercellular fibrocollagenous stroma. These features confirmed the diagnosis of ameloblastoma (Figure 6).

At 2 months postoperatively, the patient showed satisfactory aesthetic and functional recovery, with good oral competence and restoration of mandibular contour (Figures 7 and 8).

Discussion

Although histologically benign, ameloblastoma is recognized for its locally aggressive behavior, significant bone destruction, and high recurrence potential if inadequately treated. It is well-established that ameloblastoma originates from the enamel organ, remnants of odontogenic epithelium, and the lining of odontogenic cysts [6]. The conventional form, including follicular and plexiform subtypes, exhibits a greater tendency for cortical perforation, soft tissue invasion, and recurrence than less common variants [7]. Giant ameloblastomas, such as those presented in this case series, represent an uncommon clinical entity. They are typically defined as lesions that have attained massive dimensions over prolonged periods, often due to delayed presentation, limited access to healthcare, or patient reluctance for treatment because of fear, cost, or anticipated surgical morbidity [7,8].

Ameloblastoma affects both sexes, although several studies have reported a slightly higher incidence in females [9]. In line with these observations, our case series has included patients from both sexes. Both patients were between 20 and 40, which aligns with the reported age range for ameloblastoma. Consistent with the reported observations in the literature, in both cases, the lesions were located in the mandibular angle ramus area [10], involving the molar or ascending ramus region.

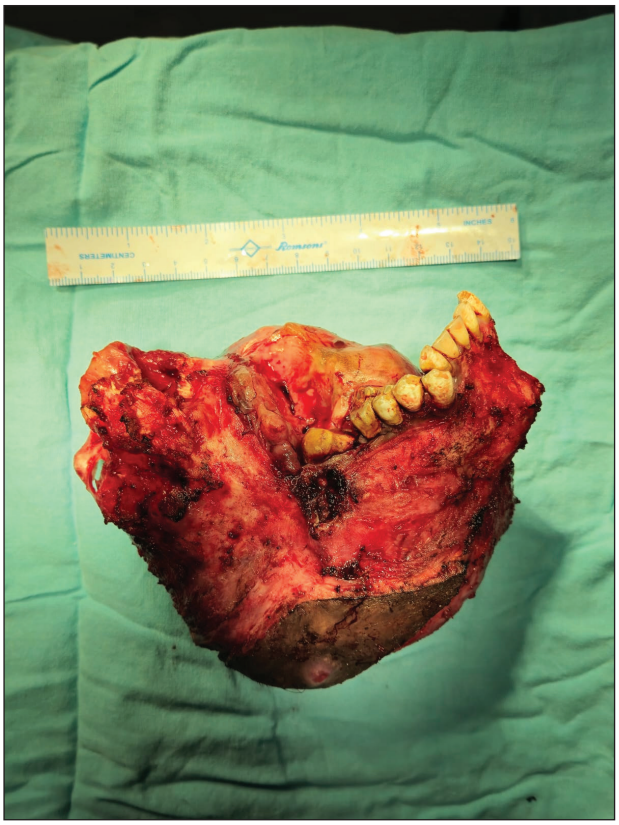

Figure 5. *Surgically excised specimen.*

However, some studies, including those by Chukwuneke et al. [11] and Adekeye [12], reported a predominance of lesions in the anterior mandible, highlighting variations across different populations. The reasons for these differences remain unclear but have been speculated to involve histopathological and molecular variations

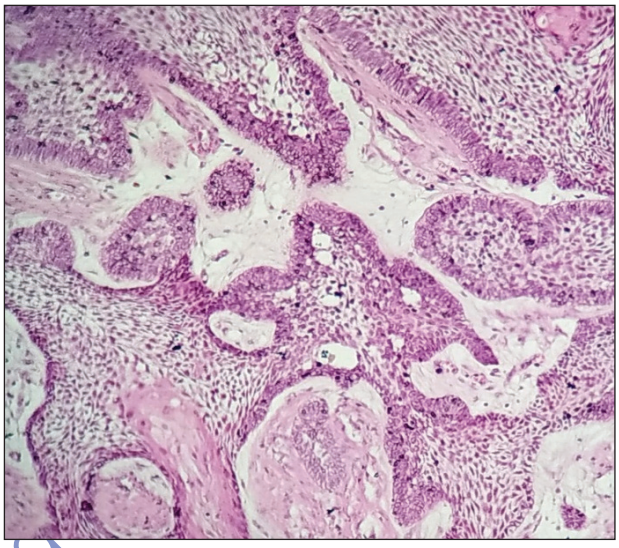

Figure 6. *Histologic specimen of the lesion.*

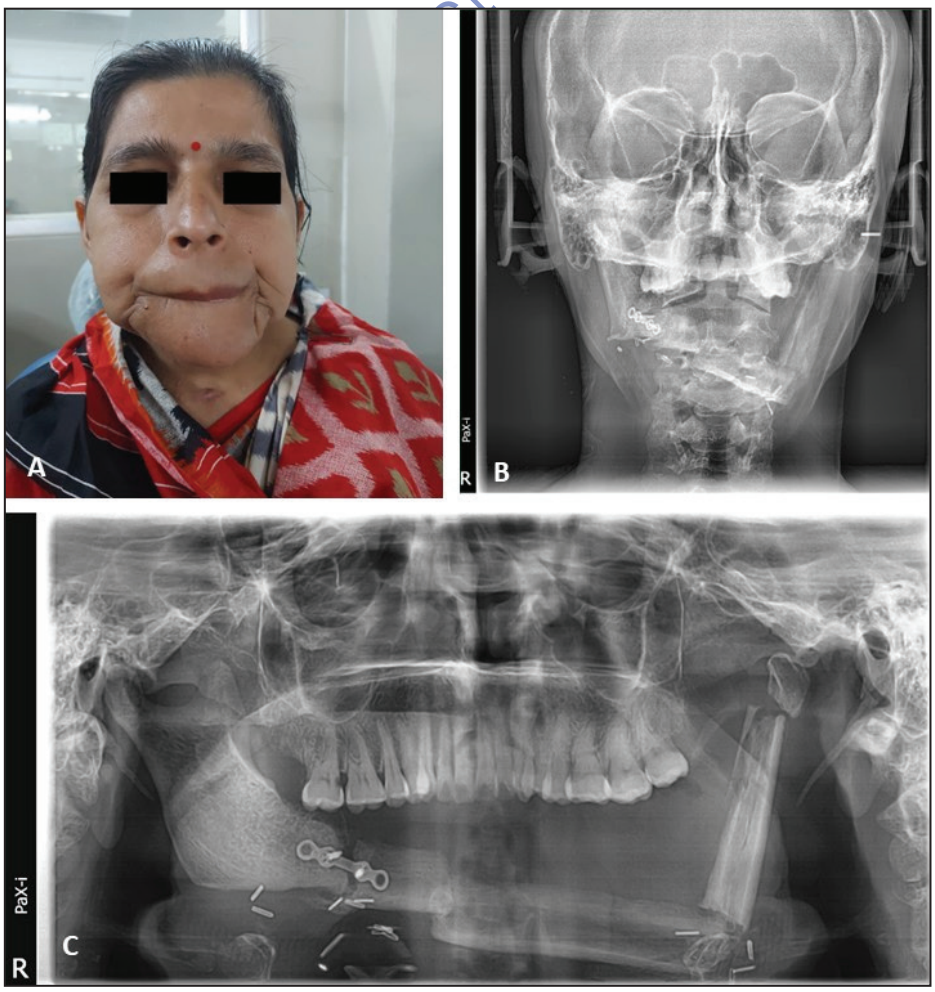

Figure 7. *(A) Post-operative clinical image of Case 1. (B) Post-operative PA view of case 1. (C) Post-operative OPG of case 1.*

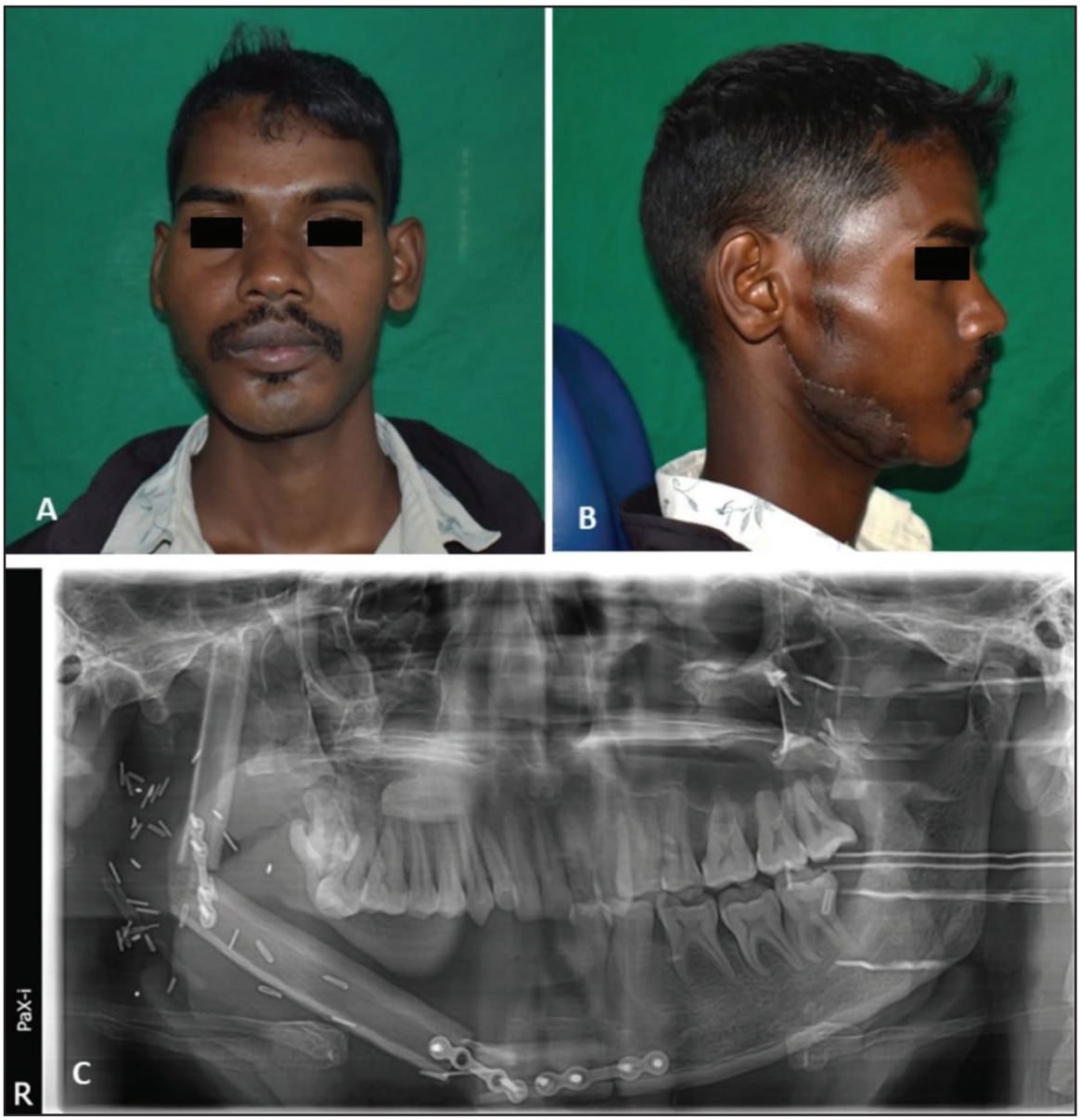

Figure 8. *Post-operative clinical images of Case 2.*

among ethnic groups. Clinically, mandibular ameloblastomas often present with swelling, altered occlusion, and sensory disturbances. For example, Verma and Das [13] reported that 38.9% of patients presented with swelling, 13.5% experienced paresthesia of the mandibular nerve, and 11% had altered occlusion. In line with these observations, our patient exhibited both altered occlusion and mandibular nerve paresthesia, underscoring the functional impact of the lesion in addition to facial deformity.

The clinical course of giant ameloblastomas is often insidious. In both of our cases, the lesions had been progressively enlarging for over a decade, eventually causing considerable facial asymmetry, functional compromise, and psychological distress. Patient 1 presented with extensive mandibular involvement extending from the right body to the left angle, with secondary complications including numbness, paraesthesia, and intermittent purulent discharge, similar to the study by Al Omari and Hakami [14]. Patient 2 had a combined mandibular and maxillary lesion with an active draining sinus and associated nutritional anemia. These presentations underscore the potential morbidity associated with long-neglected tumors and highlight the importance of early recognition and intervention.

Radiographically, giant ameloblastomas frequently exhibit multilocular radiolucencies with characteristic "soap-bubble" or "honeycomb" patterns. Cortical thinning, perforation, and displacement of teeth are common findings [15]. Both patients demonstrated classic radiographic features, with extensive cortical erosion and multilocular internal architecture. Imaging plays a critical role in diagnosis and preoperative planning, enabling accurate assessment of tumor extent, cortical involvement, and proximity to vital neurovascular structures.

Cross-sectional imaging, particularly contrast-enhanced computed tomography, provides essential detail for surgical planning and reconstruction.

Histologically, multicystic and mural unicystic ameloblastomas are considered the most aggressive subtypes, carrying a higher risk of recurrence [16,17]. In our series, both lesions demonstrated proliferative ameloblastic epithelium arranged in follicles, interconnecting strands, and cords, with peripheral palisading of tall columnar cells and central stellate reticulum-like cells exhibiting degenerative changes. These features align with conventional ameloblastoma histology but also reflect the expansive nature of giant variants.

As observed in both patients, recurrent ameloblastoma further emphasizes the importance of complete resection with adequate margins, given the high likelihood of regrowth following conservative procedures such as enucleation or curettage [18]. Surgical management of giant ameloblastomas poses significant challenges due to tumor size, involvement of multiple anatomic regions, and associated functional deficits. Radical resection remains the cornerstone of treatment, aiming to achieve negative margins while minimizing the risk of recurrence [19]. Both patients underwent hemimandibulectomy followed by immediate reconstruction using free fibula osteocutaneous flaps. This approach offers several advantages: restoration of mandibular continuity, provision of sufficient bone stock for dental rehabilitation, improved facial symmetry, and single-stage functional and aesthetic recovery. Microvascular anastomosis between the peroneal and recipient facial vessels was successful in both cases, with uneventful postoperative courses. Literature supports this approach, highlighting favorable outcomes with free vascularized flaps in significant mandibular defects [20].

The functional outcomes in our cases were notable. Both patients regained oral competence, including adequate mastication and speech, within weeks of surgery. Esthetic restoration, including mandibular contour and facial symmetry, was satisfactory, improving social confidence and quality of life. These outcomes underscore that, despite the intimidating size of giant ameloblastomas, decisive radical management combined with immediate reconstruction can achieve excellent functional and aesthetic results.

An important consideration in giant ameloblastomas is recurrence risk. Long-term follow-up is essential, particularly for recurrent lesions, since recurrence can occur several years postoperatively. In our cases, the patients demonstrated no evidence of recurrence during the follow-up period. However, continued monitoring is recommended, given the aggressive potential of follicular and plexiform subtypes. Additionally, systemic and nutritional considerations should not be overlooked, as observed in the second patient, whose chronic lesion and discharge contributed to anemia. Multidisciplinary coordination, including hematology and nutrition, optimizes preoperative status and postoperative recovery.

In conclusion, though rare, giant ameloblastomas present complex diagnostic and therapeutic challenges. By sharing these cases, we aim to contribute to the literature on giant ameloblastomas and provide evidence that, with decisive management, excellent outcomes are achievable even in extensive lesions.

What is new?

This case series documents two rare presentations of giant ameloblastoma involving the posterior mandible, managed with hemimandibulectomy and immediate free fibula flap reconstruction. It underscores the importance of early radical surgery combined with microvascular reconstruction in restoring function and aesthetics.

List of Abbreviations

CECT	Contrast-enhanced computed tomography
CT	Computed tomography
FNAC	Fine needle aspiration cytology
OPG	Orthopantomography

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

Nil.

Consent to participate

Written informed consent was obtained from both patients for publication of clinical details and images.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author details

Sonia Mundu[1], Fakir Mohan Debta[2], Shreeyam Mohapatra[3], Kunal Agarwal[4], Priyanka Debta[5]

1. Postgraduate, Department of Oral Medicine and Radiology, SCB Dental College and Hospital, Cuttack, India
2. Professor and HOD, Department of Oral Medicine and Radiology, SCB Dental College and Hospital, Cuttack, India
3. Associate Professor, Department of Oral Medicine and Radiology, SCB Dental College and Hospital, Cuttack, India
4. Assistant Professor, Department of Oral Medicine and Radiology, SCB Dental College and Hospital, Cuttack, India
5. Professor, Department of Oral Pathology and Microbiology, Institute of Dental Sciences, BBSR, India

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Summary of the case

1	Patient (gender, age)	40-year female, 23 year male
2	Final diagnosis	Recurrent Giant Ameloblastoma (multicystic follicular type)
3	Symptoms	Swelling on mandible from right to left , swelling on right mandible and maxilla
4	Medications	NA
5	Clinical procedure	hemimandibulectomy with single-stage reconstruction using a free fibula osteocutaneous flap
6	Specialty	Oral Medicine and Radiology